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Alleviation of Gopher Damage to Forest
Tree Regeneration in Idaho

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Progress Report on

Alleviation of Gopher Damage to Forest Tree
Regeneration in Idaho

by David Kaumheimer and Ken Hungerford

Ecological Services - Billings *retired (Home # 882-5674)*

To

U.S. Forest Service
Intermountain Forest and Range Experiment Station,
Boise National Forest

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1978 Progress Report

Results are incomplete and not for publication
or citation in published matter

Pocket Gopher Studies on the Boise National Forest

by David Kaumheimer and Ken Hungerford

Introduction

Work was begun in June 1978 to determine the effectiveness of packaged oat bait in controlling pocket gopher (Thomomys talpoides) damage. Previous work by the investigators and others has shown that pocket gophers will consume oats packaged in small plastic bags. It has also been shown that by packaging the bait it retains its ability to act as an effective poison over a much longer period of time than unpackaged bait. This project was designed then to see whether or not the time between poisoning operations on a given area could be appreciably lengthened by using packaged instead of unpackaged bait. To do this we are comparing the amount of gopher-caused seedling damage and the level of gopher activity on a series of 1 acre plots which were either baited with packaged or unpackaged bait or were not baited at all.

Baiting

Three sites, totalling 30 acres in size, were established during the summer and fall. Two sites, West Willow Creek on the Idaho City Ranger District and Deadman Creek on the Boise Ranger District, consist of 12 one acre plots, 4 of which were baited with packaged bait, 4 which were

baited with unpackaged bait, and 4 which received no bait. Baiting on both of these sites was done in the summer. The last site, Buck Creek on the Boise Ranger District, consists of 6 one acre plots, 2 of each treatment type. It was baited in the fall. The total area brought into the study in 1978 was limited by Federal regulation which allows no more than 10 acres to be baited using an unregistered product or method of application without an Experimental Use Permit supplied by the EPA. Due to a lack of time a permit could not be secured prior to the field season. We now have a permit and the study will be expanded in 1979.

Data was collected concerning the amount of bait applied and the time it took to apply the bait for both packaged and unpackaged bait. For the 10 acres baited with packaged bait an average of 1 lb. per acre was applied and the mean number of acres baited per man-day was 2.6. With regular, unpackaged bait the average application was 0.2 lbs. per acre at the rate of 3.8 acres per man-day. Regular baiting then took about a third less time but the amount of bait applied was less than 30% of that applied using packaged bait.

Seedling Survival

One thousand and ninety-seven tree seedlings were located on the 3 sites. Survival of these trees will be monitored over the course of the study. In 1978 survival of seedlings was checked over the summer period on the West Willow Creek and Deadman Creek sites. The results of these checks are in Table 1. The data was analyzed using the analysis of variance (ANOVA) technique. They show that on West Willow Creek neither the % mortality caused by gophers or the % total mortality was different between the areas which received packaged bait and those that received

unpackaged bait. Both % total mortality and % gopher-caused mortality though were significantly higher on the areas which received no bait than on either type of baited area.

On the Deadman Creek site the difference in seedling mortality was not as clear cut. There was no significant difference in % gopher-caused mortality between the packaged bait areas, the unpackaged bait areas, or the unbaited areas. A Duncans multiple range test revealed that in terms of % total mortality there was no significant difference between packaged baited and unpackaged baited areas, and between packaged baited and no bait areas but there was a significant difference between unpackaged baited and no bait areas.

Gopher Activity

Checks on gopher activity were made just prior to baiting and 3 weeks following baiting using the open-hole technique (Miller 1958) on the West Willow Creek and Deadman Creek sites. The results of the checks are shown in Table 2. Chi-square analysis of these results shows that on the West Willow Creek site there was no significant difference in activity between the treatment types prior to baiting but after baiting both packaged and unpackaged bait areas were significantly lower in activity than the unbaited areas. There was no significant difference in activity between the areas baited with packaged bait and those baited with unpackaged bait after baiting. On the Deadman Creek site there was no significant difference in activity between the packaged bait, unpackaged bait, or unbaited plots prior to or 3 weeks after baiting. There was however a significant drop in activity on all of the plots following baiting.

Plans for 1979

The packaged bait project will be expanded under our Experimental Use Permit. Possibly as many as 3 additional sites, each consisting of 15 one acre plots, will be added to the project. Checks on seedling mortality and gopher activity will be made on the areas baited in 1978 in the spring or early summer. Further checks on seedling mortality will be made in the fall on all areas brought into the study by that time.

Information on the economics of packaged baiting will be collected during the summer. Economic information on regular baiting will also be collected on a forest-wide scale using a form developed by Boise Forest and University personnel. The information gathered should give us a clear idea on how much money is being spent and how it is being spent for gopher control on the Boise Forest.

We will also be establishing sites to look at the effectiveness of baiting an area prior to timber harvest in controlling pocket gopher damage at a later date.

Literature Cited

Miller, M. A. 1953. Experimental studies on poisoning pocket gophers. *Hilgardia, Calif. Agr. Exp. Sta.* 22:131-166.

Table 1. Seedling Survival.

	<u>Summer 1978</u>	<u>Fall 1978</u>		
	# Trees Alive	# Trees Alive	# Trees Dead	# Trees Killed by Gophers
West Willow Creek				
Reg. Bait	143	126	17	3
Packaged Bait	151	137	14	3
No Bait	140	110	30	12
TOTAL	434	373	61	18
Deadman Creek				
Reg. Bait	148	113	35	6
Packaged Bait	131	82	49	6
No Bait	133	64	69	4
TOTAL	412	259	153	15

Table 2. Gopher Activity Determined by the Open-hole Technique.

	% Activity		
	Regular Bait	Packaged Bait	No Bait
West Willow Creek			
Prior to baiting	59	50	51
Post-baiting	11	7	49
Deadman Creek			
Prior to baiting	64	70	56
Post-baiting	15	5	16